

Jan 15
2026

Regular Expression - Helpful Identities

page 56 of Maheshwari & Smid

Theorem 2.7 Let r_1, r_2 and r_3 be two re's

The following identities hold:

1. $r_1 \emptyset = \emptyset r_1 =$

2. $r_1 \varepsilon = \varepsilon r_1 =$

3. $r_1 + \emptyset = \emptyset + r_1 =$

4. $r_1 + r_1 =$

5. $r + r_2 = r_2 + r_1$

6. $r_1 (r_2 + r_3) = r_1 r_2 + r_1 r_3$

7. $(r_1 + r_2) r_3 = r_1 r_3 + r_2 r_3$

8. $r_1 (r_2 r_3) = (r_1 r_2) r_3$

9. $\emptyset^* =$

10. $\varepsilon^* =$

11. $(\varepsilon + r_1)^* =$

12. $(\varepsilon + r_1)(\varepsilon + r_1)^* = r_1^*$

13. $r_1^*(\varepsilon + r_1) = (\varepsilon + r_1) r_1^* = r_1^*$

14. $r_1^* r_2 + r_2 =$

15. $r_1 (r_2 r_1)^* = (r_1 r_2)^* r_1$

16. $(r_1 + r_2)^* = (r_1 r_2)^* r_1 = (r_2^* r_1)^* r_2^*$